

What is claimed is:

1. A vibration detection apparatus for an electronic percussion instrument for detecting vibrations caused by striking of the electronic percussion instrument, comprising:
  - a frame comprising:
    - an outer peripheral section for engaging a top rim of a body of the electronic percussion instrument;
    - a center section arranged at the approximate center of the outer peripheral section; and
    - a linking section surrounding the center section and extending from the center section toward the outer peripheral section to link the center section with the outer peripheral section; and
    - a rim shot sensor arranged at the center section of the frame for detecting vibrations of the frame.
2. The vibration detection apparatus claimed in claim 1, wherein the outer peripheral section of the frame comprises a flange.
3. The vibration detection apparatus claimed in claim 2, wherein the flange has a lower concave surface for engaging a convex surface of the top rim of the body.
4. The vibration detection apparatus claimed in claim 2, wherein the outer peripheral section of the frame comprises a plurality of slits extending through the flange and into a sidewall of the outer peripheral section.
5. The vibration detection apparatus claimed in claim 1, wherein the linking section is comprised of at least three arms that extend between the center section and the outer peripheral section and are approximately equally spaced around the center section.

6. The vibration detection apparatus claimed in claim 5, wherein the arms have an approximately U-shaped cross-section.

7. The vibration detection apparatus claimed in claim 5, wherein the arms are provided with a plurality of openings.

8. The vibration detection apparatus claimed in claim 1, wherein the linking section is provided with a plurality of openings.

9. The vibration detection apparatus claimed in claim 1, wherein the rim shot sensor is affixed to the center section of the frame by double-sided cushioning tape.

10. The vibration detection apparatus claimed in claim 1, further comprising a head sensor supported by the frame at an approximate center of the frame.

11. The vibration detection apparatus claimed in claim 10, further comprising a cushioning material arranged above the head sensor for engaging a head of the electronic percussion instrument to transmit vibrations of the head to the head sensor.

12. The vibration detection apparatus claimed in claim 10, wherein the head sensor is mounted on a support plate that is coupled to the frame through a vibration isolating damper.

13. The vibration detection apparatus claimed in claim 12, wherein the head sensor is affixed to the center section of the frame by double-sided cushioning tape.

14. A vibration detection apparatus for an electronic percussion instrument for detecting vibrations caused by striking of the electronic percussion instrument, comprising:
- a frame comprising:
    - an outer peripheral section for engaging a top rim of a body of the electronic percussion instrument;
    - a center section arranged at the approximate center of the outer peripheral section; and
    - a linking section surrounding the center section and extending from the center section toward the outer peripheral section to link the center section with the outer peripheral section;
  - a head sensor supported by the frame at an approximate center of the frame; and
  - a cushioning material arranged above the head sensor for engaging a head of the electronic percussion instrument to transmit vibrations of the head to the head sensor.
15. The vibration detection apparatus claimed in claim 14, wherein the outer peripheral section of the frame comprises a flange.
16. The vibration detection apparatus claimed in claim 15, wherein the flange has a lower concave surface for engaging a convex surface of the top rim of the body.
17. The vibration detection apparatus claimed in claim 15, wherein the outer peripheral section of the frame comprises a plurality of slits extending through the flange and into a sidewall of the outer peripheral section.
18. The vibration detection apparatus claimed in claim 14, wherein the linking section is comprised of at least three arms that extend between the center section and the outer peripheral section and are approximately equally spaced around the center section.

19. The vibration detection apparatus claimed in claim 18, wherein the arms have an approximately U-shaped cross-section.

20. The vibration detection apparatus claimed in claim 18, wherein the arms are provided with a plurality of openings.

21. The vibration detection apparatus claimed in claim 14, wherein the linking section is provided with a plurality of openings.

22. The vibration detection apparatus claimed in claim 14, wherein the head sensor is mounted on a support plate that is coupled to the frame through a vibration isolating damper.

23. The vibration detection apparatus claimed in claim 22, wherein the head sensor is affixed to the support plate by double-sided cushioning tape.

24. An electronic percussion instrument comprising:  
a hollow cylindrical body;  
a frame arranged within the body and having an outer peripheral section engaging an end portion of the body, a center section that is arranged at an approximate center of the body, and a linking section surrounding the center section and extending from the center section toward the outer peripheral rim to link the center section with the outer peripheral rim;  
a rim shot sensor arranged in the center section of the frame for detecting the vibrations of the frame;  
a head arranged as a striking surface at the end portion of the body;  
a head sensor supported by the frame at an approximate center of the frame;  
a cushioning material arranged between the head and the head sensor for transmitting vibrations of the head to the head sensor; and

a rim engaging the body to hold the outer peripheral section of the frame and the head between the rim and the end portion of the body and to impart tension to the head.

25. The electronic percussion instrument claimed in claim 24, wherein the outer peripheral section of the frame comprises a flange.

26. The electronic percussion instrument claimed in claim 25, wherein the flange has a lower concave surface for engaging a convex surface of the top rim of the body.

27. The electronic percussion instrument claimed in claim 25, wherein the outer peripheral section of the frame comprises a plurality of slits extending through the flange and into a sidewall of the outer peripheral section.

28. The electronic percussion instrument claimed in claim 24, wherein the linking section is comprised of at least three arms that extend between the center section and the outer peripheral section and are approximately equally spaced around the center section.

29. The electronic percussion instrument claimed in claim 28, wherein the arms have an approximately U-shaped cross-section.

30. The electronic percussion instrument claimed in claim 28, wherein the arms are provided with a plurality of openings.

31. The electronic percussion instrument claimed in claim 24, wherein the linking section is provided with a plurality of openings.

32. The electronic percussion instrument claimed in claim 24, wherein the rim shot sensor is affixed to the center section of the frame by double-sided cushioning tape.

33. The electronic percussion instrument claimed in claim 24, wherein the head sensor is mounted on a support plate that is coupled to the frame through a vibration isolating damper.

34. The electronic percussion instrument claimed in claim 33, wherein the head sensor is affixed to the support plate by double-sided cushioning tape.

35. The electronic percussion instrument claimed in claim 24, wherein the rim comprises retaining bolts that are coupled to retaining sections on the body for engaging the rim to the body.